Remarks

I. The Amendment to the Drawings

Applicants thank the Examiner for his approval of the proposed drawing changes. Amended drawings of sheet number 1 and sheet number 2 are enclosed, which include the corrections approved by the Examiner. Please replace drawing sheets number 1 and 2 that were originally submitted with the enclosed corrected drawing sheets.

II. The Amendment to the Claims

Independent claims 1, 12 and 121 have each been amended to replace the limitation of "four hundred nanometers" with the limitation of "two hundred nanometers." Support for this amendment can be found in the specification on page 8, lines 5-6, and in original claim 14, for example. No other claim amendments are currently being made.

III. Response to the Final Rejection

A. Independent claims 1, 12 and 121

Although amendment of claims 1, 12 and 121 is requested as mentioned above, applicants realize that entry of that claim amendment is optional and so the following discussion assumes those claims will not be amended after the Final Rejection.

B. Claims 1, 12, 82, 84-92, 95-101, 121 and 123-127

Claims 1, 12, 82, 84-92, 95-101, 121 and 123-127 stand rejected under 35 USC 102(e) as being anticipated by Sasaki (US 6,330,127).

With respect to claims 1, 82 and 84-90, the Office Action states: "Sasaki (US 6,330,127) teaches a transducer...wherein the training trailing magnetically soft layer has a width measured in a direction substantially parallel to the amagnetic layer, the width being less than about four hundred nanometers and greater than about twenty angstroms (lines 20-21 in column 22, for instance)[as per claim 1]."

Applicants respectfully disagree. Sasaki '127 states: "As a result, a width of the top area 27a(1) of the top pole tip 63a can be micronized as precise as 0.5 to 0.25 μm." Applicants are unsure exactly what is meant by "micronized" in this sentence, but believe

from reading the remainder of the patent that "micronized" means reduced, as in etched or impinged by IBE. For example, in column 14, lines 45-49, Sasaki '127 states: "Next, a trim structure is formed by etching the write gap layer 9 and the bottom pole about 0.3 to 0.5 μm by, for example, ion milling using the top pole 17 as a mask. The trim structure is for suppressing the widening of the substantial track width when writing."

Thus "micronized as precise as 0.5 to 0.25 μm" means reduced as accurately as 0.5 to 0.25 μm. In contrast, when, Sasaki '127 refers to the end result of the reducing rather than the process of reducing, it uses the phrase "micronized to." For example, in column 22, lines 57-59, Sasaki '127 states: "As a result, the width of the first magnetic layer portion can be micronized to, for example, sub-microns."

It is also unlikely that Sasaki '127 would be able to form a trailing pole layer to a width of 0.25 μm by the photolithography and electroplating described in that patent. For example, in column 14, lines 34-42, Sasaki '127 states: "Next, a photoresist pattern (not shown) is formed by applying photoresist on the electrode film, patterning it by photolithography and applying frame plating. Next, the top pole tip 27a and the magnetic path forming pattern 27b of about 3 to 5 μm in thickness are formed by electroplating using photoresist pattern as a mask, and the electrode film as a seed layer, then, the photoresist pattern is removed. The top pole tip 27a takes a shape shown in FIGS. 20 and 21, for example."

First note that the photoresist must be at least 3 to 5 μm in thickness to electroplate the top pole tip 27a to that thickness. In actuality, photoresist is applied as a thick gel that is not perfectly uniform in thickness, so the photoresist probably has a thickness that is at minimum twice that of the desired pole thickness. Stated differently, to form a channel in that photoresist having a thickness of 0.25 μm for electroplating, the channel would have a height-to-width aspect ratio of perhaps forty-to-one. Second, note that visible light has a wavelength range of about 0.4 μm -0.7 μm. Each edge of the 0.25 μm channel would need to be 0.125 μm from the center. Diffraction from a mask that is removed by 10 μm from the bottom of the photoresist would be expected to be highly problematic if not debilitating for channels having a width of one wavelength or less. Instead Sasaki proposes micronizing (reducing) as precisely as 0.5 to 0.25 μm, to arrive at

submicron widths. Note finally that it would be very difficult to reduce a layer to a width that was less than the tolerance by which the reduction occurs.

In accordance with this interpretation are the widths listed in column 11, line 52 of Sasaki '127 "Width W2 of the top area 17c=0.6 to 1.2 μm" and in column 15, line 65 of Sasaki '127 "Width W2 of the top area 27a(1)=0.4 to 1.2 μm."

For at least these reasons, applicants respectfully assert that claims 1 and 82-90 are not anticipated by Sasaki '127.

With respect to claims 12, 91-92 and 95-101, the Office Action states: "Sasaki (US 6,330,127) teaches a transducer ... the trailing magnetically soft layer being oriented substantially perpendicular to the magnetoresistive sensor layer (as shown in FIG. 38B, for instance) and having a width measured in a direction substantially parallel to the magnetoresistive sensor layer, the width being less than about four hundred nanometers and greater than about twenty angstroms (lines 20-21 in column 22, for instance)[as per claims 12 and 98-99]."

As mentioned above, applicants respectfully disagree with the Office Action interpretation of lines 20-21 in column 22 Sasaki '127. For at least this reason, applicants respectfully assert that claims 12 and 91-100 are not anticipated by Sasaki '127.

With respect to claims 121 and 123-127, the Office Action states: "Sasaki (US 6,330,127) teaches a transducer ... the trailing pole-tip aligned with the magnetoresistive sensor layer along a longitudinal direction layer (as shown in FIG. 38B, for instance) and having a width measured in a track-width direction that is perpendicular to the longitudinal direction, the longitudinal and track-width directions being substantially parallel to the media-facing surface, said width being less than four hundred nanometers and greater than twenty angstroms (lines 20-21 in column 22, for instance)[as per claim 121]."

As mentioned above, applicants respectfully disagree with the Office Action interpretation of lines 20-21 in column 22 Sasaki '127. For at least this reason, applicants respectfully assert that claims 121-127 are not anticipated by Sasaki '127.

C. Claims 1, 12, 82, 84-88, 91-92, 95-99, 121 and 123-125

Claims 1, 12, 82, 84-88, 91-92, 95-99, 121 and 123-125 stand rejected under 35 USC 102(e) as being anticipated by Sasaki (US 6,583,954).

Accompanying this Amendment is a Declaration of Kenneth E. Knapp under 37 C.F.R. § 1.131, which obviates this rejection.

D. Other Cited Art

The other art cited in the Office Action has been reviewed. Takano et al. (US 5,850,326) teaches focused ion beam etching of a pole surface. Kamijima (US 6,483,664) teaches that "It is possible that the width of the magnetic pole portion 116a will be around 0.4 μm of the submicron order in future."

IV. Conclusion

Applicants have responded to each item of the Office Action, and respectfully request reconsideration of the pending claims. Applicants believe that the claims are in condition for allowance, and a Notice of Allowance is solicited. A Notice of Appeal accompanies this Amendment, along with the requisite fee.

Respectfully submitted,

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS AF, P.O. Box 1450, Commissioner for Patents, Alexandria, VA 22313-1450, on October 16, 2003.

Date: 10-16-03

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